

Economics and Ecometry

Published in 2000, updated on February 28, 2022.

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Texts with  signify new or updated text.

Texts in black on white background are my texts, including My Fragments (MF#).

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Economics Quotes

Irving Fisher (1928). "*The Money Illusion*." Martino Publishing.

"*Unstable money explains at least part of the secret of business fluctuations...*," p. 89.



My Fragments - From My Personal Point of View

For the complete list, please see [Tamari](#).

MF7: *Globalization + Computerization = Tsunamization*. Added 9 October 2008.

MF11: *Collectivization and privatization are crimes against humanity*. Added 24 July 2010.

MF20: *Words are clouds and mathematics is the rain*. Added 12 March 2012.

MF22: *When the money illusion stops, Gresham's Law start to operate*. Added 28 July 2014.



Economics

The main conclusions in Ben Tamari's publications are:

► The Neutrality of Money:

Money is **not** a neutral entity in the economic process, because it is simultaneously a **measure** and an **input**. Thus, there is an optimal quantity of money that should be 'employed' in any given country, and the **Ecometry** method may be used to determine that optimum quantity. This is a generalization of Keynes' theory.

► Inflation is a Symmetrical Phenomenon:

Inflation is a symmetrical phenomenon; both money and output, which are brought to the market and replace one another, have a part in its formation. Because of the relativity of the measure (money) and the entity to be measured (output), we tend to view inflation as a monetary phenomenon.

► Nominal Anchor:

The Nominal Anchor of setting the rate of printing to **equal** the rate of growth ($\mathbf{p} = \mathbf{q}$) is consistent with economic theory and empirics as represented here. This old-new rule enhances an economy's health, and moderates the adjustment processes and pressures in the rehabilitation of pathological economies.

► Conservation and the Symmetry Laws:

The formal structure satisfying the conditions of conservation and symmetry laws: $\mathbf{p} = \mathbf{m} - \mathbf{o}$, where $\mathbf{p}$ = Inflation (the rate of change of pricing), $\mathbf{m}$ = Printing (the rate of change in money), and $\mathbf{o}$ = Growth (the rate of change in output). This is the **Pricing Law** or **Symmetry Law**, and the alternative and more generalized version of Samuelson's **Conservation Law**. As the old saying goes, "*Inflation occurs when too much money is chasing too few goods*."

► Keynes Space and Complex Numbers:

An autonomous economic system, i.e., a country, tends to be a **conservative** and **symmetrical** system in Keynes space **[O.M]**, and can therefore be represented as a complex numbers system. This presentation makes it possible to aggregate or disaggregate the system at all levels, from the individual to the most general aggregate and vice versa.



Published by: **Ecometry** Ltd.

Publications by Ben Tamari:

Books

Ben Tamari (1990). "[*Foundations of Economics*](#)." Hebrew.



Abstract: This book proposes a new way to explain and forecast economic processes. We know that forecasting in a conservative system may be done well (just like in energy and weather systems, the more closed the system, the better the forecasting). An autonomous economic system (i.e., a country) is a conservative system in Keynes space, defined as an output-money space (i.e., a market).

Ben Tamari (1995). "[*Dynamic Economy*](#)." Hebrew.



Abstract: A conservative system in which rates are linearly related is a symmetric system. Symmetry dictates that the inflation rate equals the money-printing rate minus the growth rate. An empirical study of 45 countries between the years 1960 and 1993 verifies the principles of both conservation and symmetry. Tamari's theories enable good economic forecasting through formulating 'motion equations' (derived from the Lagrangian function) and their solutions (Lorentz transformations), based on the conservation and symmetry principles as described in his books.



On 15 October 2014, I learned about Dobriner / Willmore surfaces, which express mathematically what I had in mind when writing the book. All the equilibrium points (where demand equals supply over the course of time) are constrained in a geometric shape, like in a pipe or torus, which expresses the invariance and conservation in nature - and physics or economics as well. You can't build a perpetum-mobile in physics and you can't create growth by printing money. Added 12 October 2014.

Ben Tamari (1997). "[*Conservation and Symmetry Laws and Stabilization Programs in Economics*](#)." English.



Abstract: An autonomous economic system, i.e., a country, tends to be a conservative and a symmetrical system in Keynes space (Output, Money and Time [O, M, t]), and can therefore be represented as a complex numbers system. This presentation makes it possible to aggregate (or disaggregate) the system at all levels, from the individual to the most general aggregate (and vice versa). It also offers a simultaneous solution to the problem of allocating and distributing useful resources in the market.

Software

Ben Tamari (2005). "[*Eco - Economic Simulator*](#)." Softwaree.



Abstract: Eco - Economic Simulator software - an application of the Tamari attractor - enables the study of a country's economy. The software performs a simulation of the country's economy: analysis, planning, prediction and comparison with other nations' economies, based on data in International Financial Statistics (IMF) for the years 1960-2011 for 26 select countries.

The simulator was designed for five purposes:

- ▶ To simulate a country's economy, for which we need a three dimensional space called the **Economic Cosmos** (the Nest/Tamari space), or an **OUTPUT-MONEY-PRICING** [O, M, P] space. The Nest/Tamari space includes three two-dimensional subspaces:
 - Output-Money - **Keynes** space [O, M]
 - Output-Pricing - **Patinkin** space [O, P]
 - Money-Pricing - **Friedman** space [M, P]
- ▶ To compare the performance of different countries' economies according to the same measure and data scale.
- ▶ To forecast a country's economy.
- ▶ To investigate the possibility of increasing/decreasing the quantity of money per output.
- ▶ To practice the attractor tool, which is the engine of dynamic systems in nature.

Here is my Exel page [EcoSite2013](#) [for those who young enough to take the mission ahead.]



Published by "[*The Economic Quarterly*](#)," Israel.

Articles (English, *.PDF)

Ben Tamari (1981). "[*Cycles, Prices and Quantities in the Israel Housing Market - Cobweb Model*](#)," Updated March 2011.

Abstract: The housing sector in Israel: Israel's residential construction sector has always been a principal factor in the structure of business cycles in Israel, primarily as a result of waves of immigration. Increasing population, financing methods, higher income and individual investment needs all converged and came to be reflected on the demand side for housing. On the other hand, technology, private and public entrepreneurship, the housing inventory and workforce availability converged on the supply side. The position and direction of the housing sector in the business cycle can be identified by using a cobweb model.

Ben Tamari (1983). "[Gresham's Law](#);" Updated July 2021.

Abstract: The article examines the historical origins of **Gresham's Law**, '*Bad money drives out good money*,' as well as how it has evolved on one hand, and its monetary significance on the other. In fact, different phrasings of this law have different meanings. According to Tamari, the problem is not what bad money does to good money, but rather the influence of the devaluation of the legal tender on the monetary aggregates.

Ben Tamari (1985). "[Anatomy of a Tragedy](#);" Updated July 2012.

Abstract: In 1914 Germany set out to correct the injustice it deemed had been perpetrated upon it inside its territorial area in Europe, and in its colonial position outside Europe. It wished to express the military, economic and cultural power that it had consolidated in the late 19th and early 20th centuries. "*Tension seethed between the veterans in the colonial realm – Britain, France, Russia, Holland – and the hungry newcomers, such as Germany and Italy*," (Talmon, p. 488). The spirit of Bismarck haunted Germany – unification (led by Prussia), statehood and militarism. "*Fifty years were spent in the process of making Europe explosive. Five days were enough to detonate it*," (Liddel Hart, p. 17).

Thirty-four years after that unfortunate, fateful event (and perhaps because of it), the State of Israel was established. Over its first decade the state forged and strengthened itself, under the prevailing spirit of Ben-Gurion – for unity (led by the Jews from Eastern Europe), statehood and "securitism." In 1982 Israel set out to correct the injustice it deemed had been perpetrated upon it from its northern border, and exercised its military and economic power in order to dictate the terms of peace to its neighbor in the north, establish its territorial area (about a third of which was under dispute domestically, and held no agreement from without), and "erase" the traumas of the previous war.

Ben Tamari (2014). "[Economic/Tamari Attractor](#);"

Abstract: The Economic/Tamari Attractor, named for Ben Tamari, is a three dimensional [attractor](#) evolving from the dynamic system associated with the theory of countries' economics. This dynamic system is a set of partial differential equations which, according to the theory of economics developed by Tamari, control the economics of a country. The main point of this economic theory is that the **relation** between the quantity of money to the country's output is what governs the country's economic situation and outcome.

Articles (Hebrew, *.PDF)

Ben Tamari (1981). "[Cycles, Prices and Quantities in the Israel Housing Market - Cobweb Model](#);" Updated March 2011.

----- (1983). "[Gresham's Law](#);" Updated July 2021.

----- (1985). "[Anatomy of a Tragedy](#);" Updated July 2012.

----- (1986). "[Theoretical and Empirical Inflation](#);"

----- (1990). "[Why Is There No Growth in Israel?](#)"

----- (1993). "[Chaos and Stocks - Review](#);" Updated June 2011.

----- (1994). "[Chaos in Economics](#);"

Surveys (Hebrew, *.PDF)

Ben Tamari (1981). "[Patinkin and the Chicago School](#);"

----- (1983). "[Money and Freedom](#);"

----- (1984). "[Is Everything Psychology?](#)"

----- (1984). "[All That You Wanted to Say, But Don't Dare](#);"

----- (1985). "[Security and Economics in Israel](#);"

----- (1987). "[Success That Is a Failure](#);"

----- (1989). "[Keynes and Batra](#);"

Under a pseudonym with a political economic flavor (Hebrew, *.PDF).

Ori Benjamin (1981). "[We Don't Want to Go On Sleeping but to Have Fun](#)"

----- (1981). "[The Cashier Is Open and the Hand Is Writing](#)"

----- (1982). "[Bubbles: New Innovations in Economics](#)"

----- (1984). "[Facing the Reality](#)"

----- (1989). "[Three Mistakes](#)"



Ecometry

Introduction to Ecometry (Eco-nomics - Geo-metry)

What can be done to bring about the recovery of an autonomous economic system (defined as such if it issues its own currency) that has gone wrong: decelerating growth, rising unemployment and prices, deficits and debts - both domestic and foreign, and declining exchange rates?

An economic system does not fail all at once; the process is protracted, sometimes lasting two or more generations (as in the former Soviet Union). The source of failure is generally a monetary imbalance, relative to the output, which at first produces desirable results, so that the imbalance is maintained, ultimately becoming destructive (somewhat like "pep pills").

By now, sufficient knowledge and experience have been accumulated, on both the theoretical and empirical planes, to permit reforms to be introduced into such ailing economic systems. The obstacles to successful reforms are generally political. Specifically, powerful pressure groups, attempting to protect themselves against what they believe would be the recovery process's harmful effects on them, and they hinder implementation of the measures necessary for economic recovery.

One commonly proposed measure for the stabilization of an ailing economic system during planned reforms is what is known today as a 'Nominal Anchor,' the main component of which is the exogenous fixation of the monetary unit of exchange. Meritless in this measure is also the "Nominal Anchor" once he replaced by a "Real Anchor" - domestic production rate. This note, the "Economic System and the Real Anchor" will show

system's rate of exchange. My thesis in this paper is that the "Nominal Anchor," may be replaced by a preferable, dynamic operating rule. This rule, the Symmetry Law, when applied to an economic system, will steer the system asymptotically to an optimal state. As a result, the system will not experience unnecessary shocks after the stage of stabilization and curbing (e.g., Israel in 1985; Mexico in 1988). However, in order for this to happen, the Symmetry Law requires more political resolve from the system than the "Nominal Anchor."



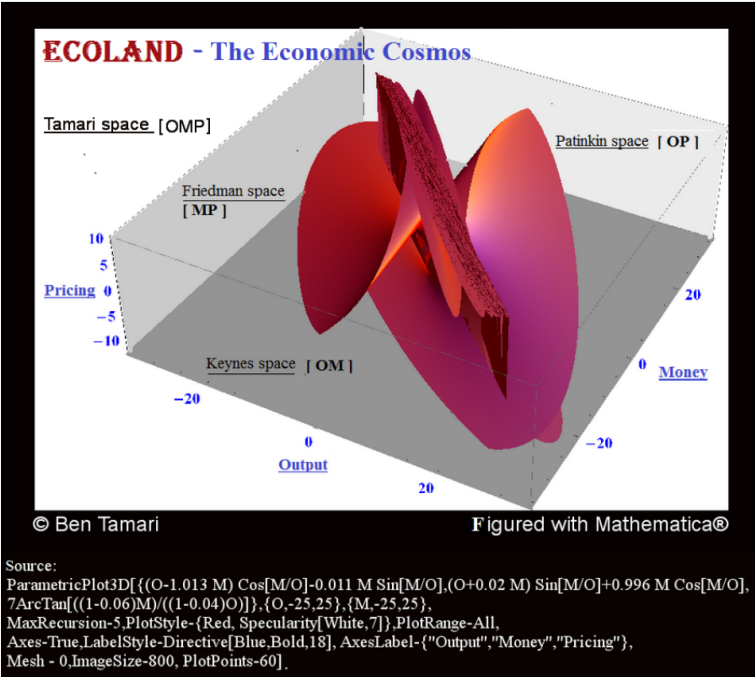
Ecoland - The Economic Cosmos - Tamari Space

Anthony Tromba, (2003) "UCSC Professor seeks to reconnect mathematics to its intellectual roots." University of California Press Release.

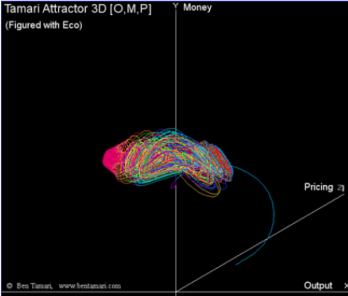
"When you discover mathematical structures that you believe correspond to the world around you, you feel you are seeing something mystical, something profound," he said. "You are communicating with the universe, seeing beautiful and deep structures and patterns that no one without your training can see."

<http://currents.ucsc.edu/03-04/08-04/tromba.html>

Ecoland, or the Economic Cosmos, or Tamari space, is a three-dimensional space: Output, Money and Pricing [O, M, P] governed by three equations; the space has three sub-dimensional spaces: Keynes space [OM], Friedman space [MP], and Patinkin space [OP].



The Tamari attractor is the trajectory solution of the three equations, which 'sail' in Tamari space:



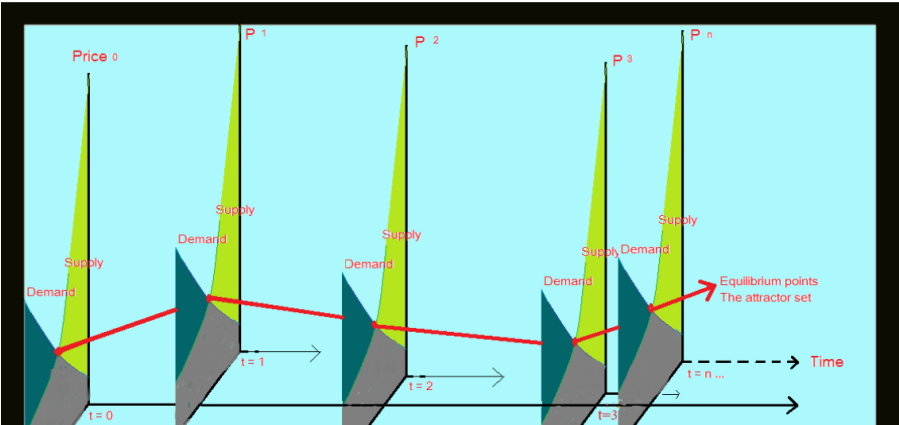
The economic simulator equations

$$\begin{aligned} X' &= (X - aY)\cos(Z) - bY\sin(Z), & X &\equiv O, & \text{output} & \text{Conservative/Cremona} \\ Y' &= (X + cY)\sin(Z) + dY\cos(Z), & Y &\equiv M, & \text{money} & \text{equations} \end{aligned}$$

$$\begin{aligned} Z' &= e + fZ + \text{garctan}[(1 - u)Y / (1 - i)X]Z \equiv P, & \text{pricing version} & \text{feedback equation} \\ Z' &= e + fZ + \text{garctan}[(1 - u) / (1 - i)XY]Z \equiv W, & \text{wealth version} & \text{feedback equation} \end{aligned}$$

Source: Ben Tamari (1997). "Conservation and Symmetry Laws and Stabilization Programs in Economics," p. 17.

Economic Equilibrium Points in time:



Q 1

Q 2

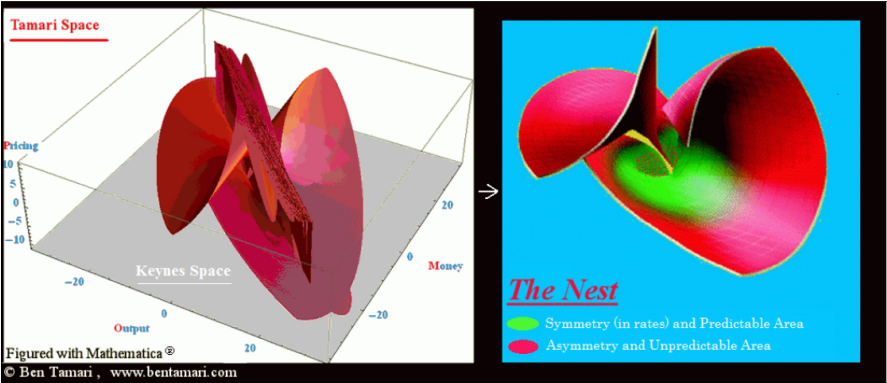
Q 3

Q n

Quantity 0

Economic equilibrium points in time

Analysis and study of the variables and invariables of each country show its position in the **Nest**. The rule according to which the economy behaves is that the deeper a country is located towards the center of the Nest (the green area), the better its position, and the more it moves towards the periphery (the red area), the worse its position.



[Eco2](#) software enables studying a country's economy. The software simulates the national economy: analysis, planning, prediction and comparison to other states' economies, according to the data in International Financial Statistics (IMF) for the years 1960-2007 (see [Simulator page](#)).

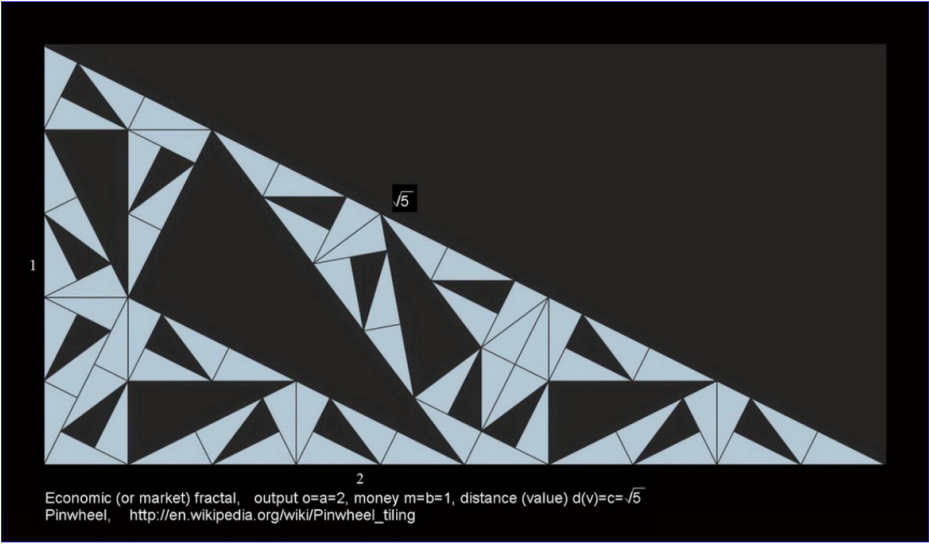


Ecometer

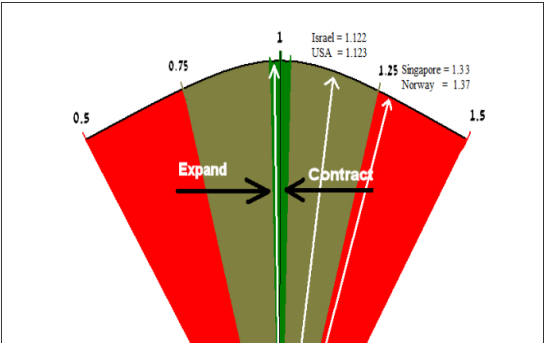
The **Ecometer** measures the conservation of a country's economic system, just like a thermometer measures body heat. It is like an X-ray showing that country's real economic situation.

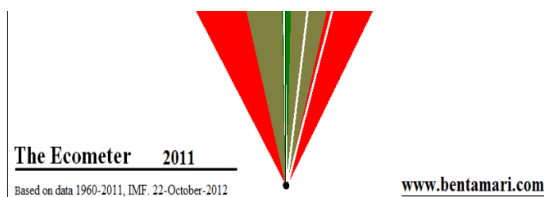
Conservation means the optimal ratio between money and output (with M/O around 0.33...; perhaps the "Golden (or [Wurf](#)) Rule" is the underlying explanation [Petukhov, p. 533 (1989)]). The **Ecometer** is the (indirect) indicator of that ratio. If the country is in a less than optimal ratio, its economy is heading for a depression; if it is in a greater than optimal ratio, the economy is "flooded" with money and must undergo a contracting and drying process.

The economic fractal or the market fractal (the [pinwheel](#)): Added 16 April 2015.



The dynamic situation in select countries: Israel, USA, Singapore and Norway (2011):





Note 1, 25 December 2007 Note on interest rates

See: [Paul A. Samuelson](#) (19 November 2007) "Balancing Market Freedoms," International Herald Tribune.

"It used to be enough for a central bank to "lean against the wind." That means lower interest rates when unemployment is too high and when deflation threatens. And when business growth is too brisk, central banks are supposed to raise their interest rates to dampen growth and to forestall price-level inflation that threatens to exceed 2 percent per year. Today, central bankers and U.S. Treasury cabinet officers cannot know [my underline, B.T.] whether current interest rates are too high or too low. This is surprising, but true. ..."

"What the world does not need now is tolerance for any persistent weakness in global Main Street growth. It is better when physicians worry too much about a patient's health than when they worry too little."

I devised the Ecometer to calculate optimum money growth and interest rates for different situations, both simple and complex. This is just the beginning, it might forecast a heat wave in Alaska and snow in the Sahara, like in the early days of weather forecasting. But I am convinced that after enough years of observation, (at least 70, from 1960 to 2030), and an adjustment process, the analysis and forecasting will be good enough to navigate the economy of a country fairly accurately.

What the world does need now is a persistent reduction in global Main Street growth, due to pollution, the shortage of resources, and unfair distribution of wealth among nations. We, as a whole, are growing too much. We must slow down Main Street growth and speed up growth in the peripheries.



Note 2, 15 April 2009 Note on the economic crisis. Updated 10 October 2014.

The economic crisis that began in 2008-09 consists of two components or layers: a shortage of resources on the planet relative to demand, and an excess of expanding monetary policy for policy for the dollar, which is the legal international currency. Old trees must die, and Obama was wrong twice, in his support of the dinosaurs, and in his infusing more money into the economy.

The symptoms of this crisis have been the opposite of those in the crisis of 1929-1936. Since the monetary system shrank back then, it was necessary to expand it. In the modern crisis, the monetary system has not shrunk but the *velocity of money* has declined. Therefore, the US government should take measures to help raise the velocity of money (by creating demand for new technologies instead of old ones). Socialism for the rich and capitalism for everyone else is not a good idea or answer.

Zero interest rates (or close to it) are a huge mistake, which is also why Japan couldn't surmount the crisis, because there was too much money and credit in the economy. A surplus of money (and low interest rates) is as destructive as a shortage of it. Money is more important than we know. It is not only a means of *measure, transaction and store value* but also a *coordinator*. Every economic unit navigates itself in "space-time and mass-energy" in the universe, according to the adage 'money talks,' or the "invisible hand" in the terminology of Adam Smith. We usually know what is profitable for us, on condition that money (relative to output) is at an optimum level, and therefore there is no inflation and no "money illusion."

According to Gresham's Law: "*Bad money drives out good from the markets*"; and the *good* drives out the *bad* from the pockets. The dollar, after a long history as good money, started to be bad money. Therefore, the real balance effect started to work, and dollars came out of pockets, creating the last bubble in the real estate markets. Two other such cases, are described in my article "*Anatomy of a Tragedy*" (1985): Germany in the '30s and Israel in the '80s. Since an optimal quantity of money (relative to output) is a wise policy, printing money **must** be taken out of the politicians' hands.

An economic system, like a weather system, can be forecasted. We are just at the beginning; the formulas are still immature and the statistical data are not yet sufficiently credible or quantitative.



Note 3, 28 February 2022 Note on the Value.

Ünsal, Ö. (2022) "Value order in disorder", International Journal of Dynamics and Control.

"Value is a non-algorithmic cognitive state that cannot be directly approached and reliably measured based on price, cost, and income (PCI)." ...

Tamari, B (1990). "[Foundations of Economics](#) [the PDF, p. 25]" Hebrew. [the book p. 39] **Value** is: $V = (Q^2 - M^2)^{1/2}$, Pythagoras number.

What Ünsal called "**Value**" I called "Utility" - The invisible hand.



Books

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Links

<http://en.wikipedia.org/wiki/Symmetry>

<http://ideas.repec.org/p/wpa/wwpfi/9411001.html>

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